

A NEW GENUS AND SPECIES OF GEOMETRIDAE (LEPIDOPTERA)  
FROM BIG BEND NATIONAL PARK, TEXAS

DOUGLAS C. FERGUSON, ANDRÉ BLANCHARD, AND EDWARD C. KNUDSON

(DCF) Systematic Entomology Laboratory, IIBIII, Agricultural Research Service, USDA, % National Museum of Natural History, Washington, D.C. 20560; (AB) 3023 Underwood, Houston, Texas 77025; (ECK) 804 Woodstock, Bellaire, Texas 77401.

---

*Abstract.*—A new genus, *Astalotesia*, is described by D. C. Ferguson, and a new species, *A. bucurvata*, is described by A. Blanchard and E. Knudson. It belongs in the tribe Melanolophiini Forbes. The male and female imagines, genitalia, and male wing venation are figured.

---

While collecting with UV light trap at Big Bend National Park, Texas, in March 1982, E. C. Knudson took a small series of an unfamiliar geometrid, which was later matched to a single specimen in A. Blanchard's collection, taken 11 years previously at the same locality. Upon dissection, the moth proved to belong to the tribe Melanolophiini Forbes. However, it possessed an unusual combination of characters that did not allow placement in any existing genus. Assignment of the new genus to the Melanolophiini was based on a comprehensive assessment of adult characters. The paired, comblike structure on the anterior margin of the eighth sternite of the male and the wide, flat, modified scales associated with it (but arising from the posterior margin of the seventh sternite) (Fig. 5), together with the unscaled branches of the bipectinate male antenna, almost always serve to distinguish moths of this tribe.

Of nine genera examined, the posterior abdominal comb is lacking only in *Vinemina* McDunnough, and is vestigial in *Carphoides* McDunnough. These two genera have also lost the modified scales, of which usually two to four pairs are present in other genera. Most melanolophiine genera also have two other secondary sexual characters on the male abdomen. These consist of a ventral, transverse row of spines or bristles, also comblike, near the middle of the third segment, and a ventrolateral pair of tufts of long hairlike scales that appear to arise from the intersegmental membrane between segments three and four. These hairy tufts resemble coremata, but do not seem to be extensible to any great degree. These anterior ventral structures of the male abdomen may be present or absent in Melanolophiini, even sometimes between species of the same genus, and both happen to be absent in *Astalotesia*. The ventral comb of the third segment also occurs in some Boarmiini, which the Melanolophiini most closely resemble, but the tufts that resemble coremata, when present, are unique to the Melanolophiini, as far as we know.

Although placement of the new genus *Astalotesia* in the tribe Melanolophiini

was not difficult, determining its relationship to other genera within the tribe did present some problems. Every effort to assign the species to a previously recognized genus failed because its particular combination of characters would fit none of them. It appears related to the group consisting of *Melanolophia* Hulst, *Pherotesia* Schaus, and *Melanotesia* Rindge. In general appearance it could be a species of *Melanolophia*, but has different, symmetrical male genitalia and more simplified female genitalia, lacks the anterior ventral comb and hairy tufts of the male abdomen, has veins  $R_1$  and  $R_2$  arising separately, not stalked, and vein Sc of the hindwing unbranched. Structurally, it comes closest to *Melanotesia* of western South America, having a similar juxta (Fig. 4a) (otherwise unique), and similar venation, but again differs in the lack of the anterior ventral structures of the male abdomen. Also, in wing color and pattern, it is not at all like the contrastingly marked *Melanotesia*. Thus the present genus differs as much or more from these and all other known genera as they do from one another. Recognition of other melanolophiine genera for purposes of comparison was greatly simplified by F. H. Rindge's revisionary studies, especially that of 1964.

### *Astalotesia* Ferguson, NEW GENUS

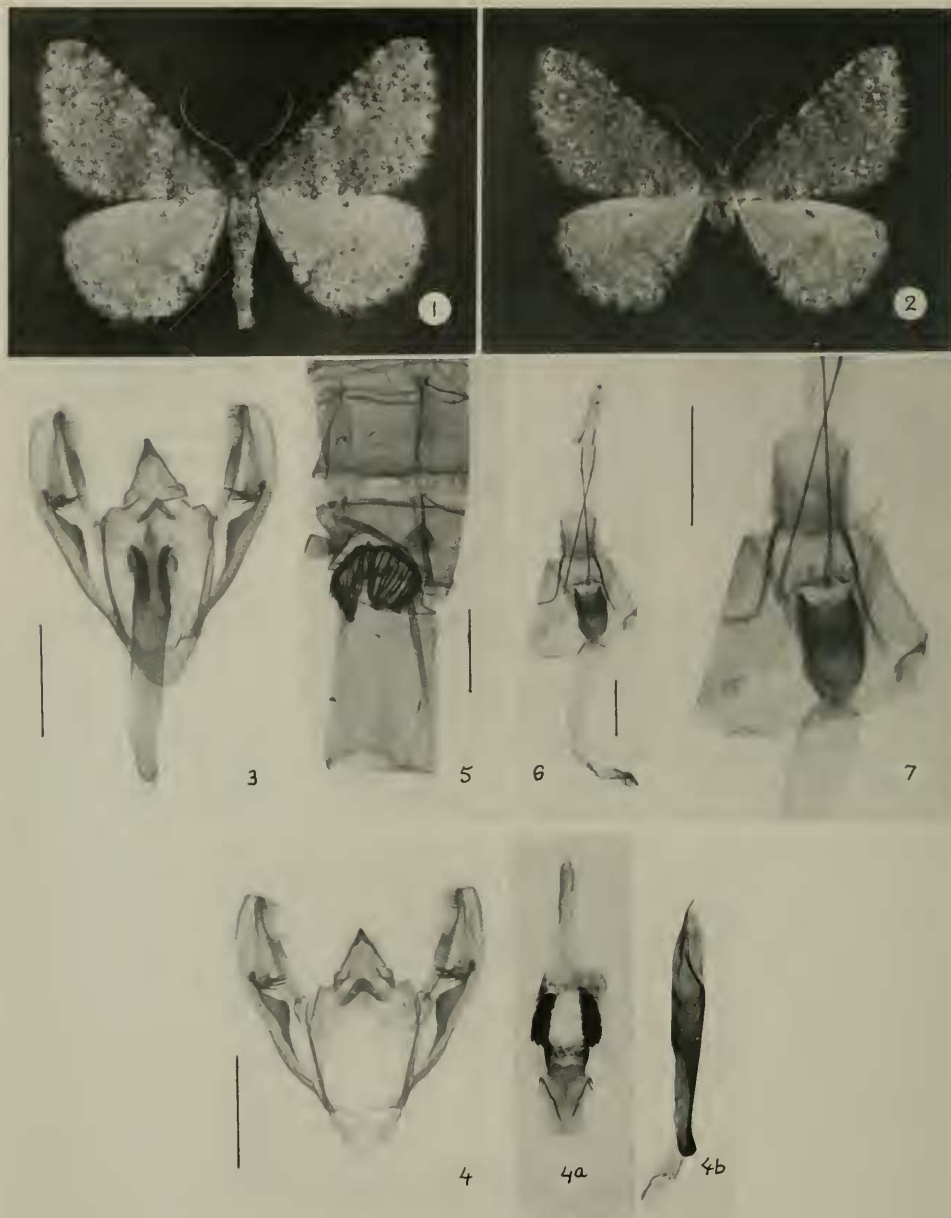
Type species.—*Astalotesia bucurvata* Blanchard and Knudson. Monotypic.

Description.—Moth similar in size to species of *Melanolophia*, cryptically colored, light gray brown with weak pattern of darker markings; hindwing not with full repetition of forewing pattern as in *Melanolophia*, but paler, with pattern reduced and essentially limited to anal  $\frac{1}{2}$  of wing. Forewing venation with  $R_1$  and  $R_2$  not stalked, but arising separately from anterior side of cell (although closely crowded together with Sc and stem of  $R_{3-5}$ ); hindwing with Sc unbranched. Male antenna bipectinate with long branches, probably longer than those of any other genus in tribe; female antenna simple. Male hindtibia long, almost twice as long as femur, cylindrical, only moderately thickened, without a hair pencil. Male abdomen without anterior ventral structures; i.e., transverse, medial row of spines or bristles on 3rd sternite and ventrolateral scale tufts associated with this segment both wanting. Paired, comblike structure between 7th and 8th sternites well developed and immediately preceded by 1 pair of greatly enlarged, flaplike, modified scales (Fig. 5) (usually 3 or 4 pairs in most closely related genera). Male genitalia with juxta highly modified, bearing 2 dense, elongated clusters of appressed spines as in *Melanotesia*; valve with medial, transverse, protuberant sclerite bearing 6 stout, sharp spines in a fanlike configuration, and basad of this, a medial, longitudinal, abruptly raised ridge bearing a dense cluster of very short spines; aedeagus simple, slender, without cornuti. Female genitalia with posterior apophyses  $3\times$  length of anterior apophyses; ostial cavity deep, not funnel-shaped, but essentially cylindrical, sclerotized, separated from bursa copulatrix only by a constriction that may represent ductus bursae; corpus bursae membranous, without signum. Early stages unknown.

### *Astalotesia bucurvata* Blanchard and Knudson, NEW SPECIES

Figs. 1-7

Description.—*Head*: Front flat, smooth scaled, fuscous. Vertex rough scaled, ochreous, apices of scales fuscous. Labial palpi ascending to just beyond eye,



Figs. 1-7. *Astalotesia bucurvata*. 1, Holotype male, Brewster Co., Texas, Big Bend National Park, Chisos Basin, 29-III-82. 2, Paratype female, same locality, Green Gulch, 28-III-82. 3, Male genitalia of paratype, from slide AB 5071, same locality, Green Gulch, 25-III-71. 4, Male genitalia of paratype, from slide ECK 315B, same locality, Green Gulch, 28-III-82. 4a, Anellus and juxta from slide ECK 315B. 4b, Aedeagus from slide ECK 315B. 5, Male abdomen from slide ECK 315B. 6, Female genitalia of paratype, slide ECK 299, same locality, Green Gulch, 28-III-82. 7, Detail of ostium bursae, slide ECK 299. The segments in Figs. 3-7 represent 1 mm.

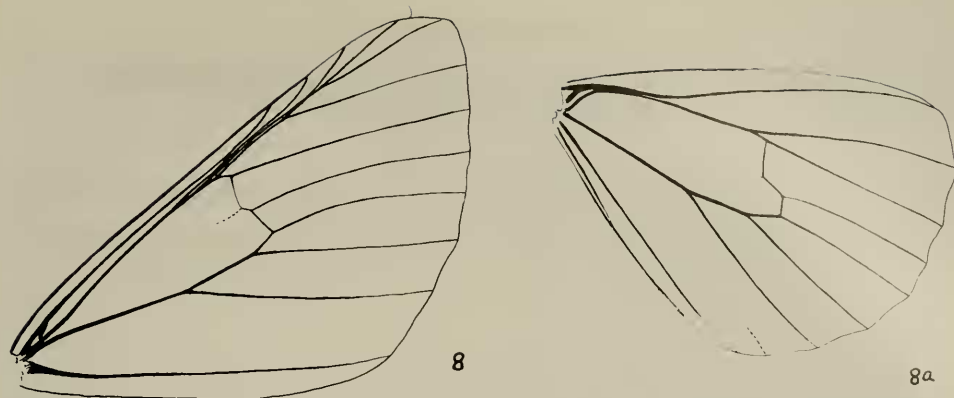


Fig. 8. *Astalotesia bucurvata*, wing venation of paratype male, slide ECK 315A, same locality as Fig. 1, Green Gulch, 28-III-82. 8, Forewing. 8a, Hindwing (frenulum omitted).

brownish ochreous, scale apices dark fuscous. Antenna, in male, bipectinate, with pectinations decreasing in length to extreme apex, which is simple, in female entirely simple.

*Thorax*: Vestiture consists of scales having a light gray base, blackish central band, and whitish gray apex. No posterior tuft.

*Abdomen*: Grayish ochreous.

*Maculation*: Male: Forewing ground color light ochreous gray, irrorated with black scales. Usual line obscure. Antemedial line from basal  $\frac{1}{5}$  of costa, convex outwardly, dark gray. Postmedial line double, angles slightly outward at margin of cell, moderately serrate, dark gray. A vaguely defined median shade between antemedial and postmedial lines. Subterminal line indicated only by 2 pairs of black spots near vein 2, and 2 or 3 pairs of black spots near vein 6. Costal margin strigulate with dark gray and light ochreous gray, interrupted by 5 quadrate grayish black patches, which originate at the am, median, pm (double), and st lines. Terminal line indicated by black intravenular spots. Fringe concolorous with ground. Hindwing lighter, with outer  $\frac{1}{2}$  more irrorated with gray black. Extradiscal line dark gray, serrate, obscure toward costa. Blackish intravenular spots or dashes along termen. Ventral surface of wings light ochreous gray, nearly immaculate, except for costal strigulations and patches, as above. Female: Both wings much more heavily irrorated with blackish scales, otherwise like male.

*Venation*: As in Fig. 8.

*Length of forewing*: Male:  $N = 5$ , 18.5–19.7 mm, average 19.2 mm; Female:  $N = 1$ , 18.0 mm.

*Male genitalia* (Figs 3–5): As in description of genus.

*Female genitalia* (Figs. 6,7): As in description of genus.

Holotype (Fig. 1).—♂, Brewster Co., Texas, Big Bend National Park, Chisos Basin, 29-III-82, collected by E. Knudson and deposited in the National Museum of Natural History, Washington, D.C.

Paratypes.—Same data as holotype, 2 ♂; Big Bend National Park, Green Gulch, 28-III-82, 1 ♂, 1 ♀ (Fig. 2), all collected by E. Knudson. Same locality, 25-III-71, 1 ♂, collected by A. and M. E. Blanchard.

## ACKNOWLEDGMENTS

The authors thank the authorities of the U.S. National Park Service and Big Bend National Park, Texas, for their assistance, past and present.

## LITERATURE CITED

- Rindge, F. H. 1964. A revision of the genera *Melanolophia*, *Pherotesia*, and *Melanotesia* (Lepidoptera, Geometridae). Bull. Am. Mus. Nat. Hist. 126(3): 241-434.